July 28, 1925. 1,547,716

F. H. BANCROFT

WOOD BENDING MACHINE

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Fig. 1

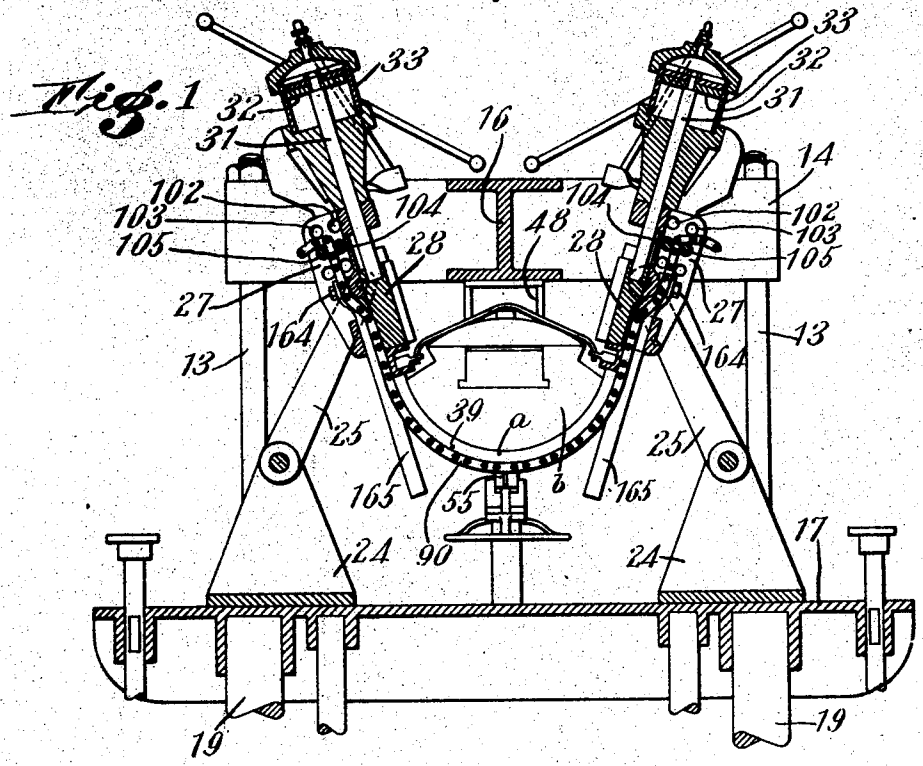
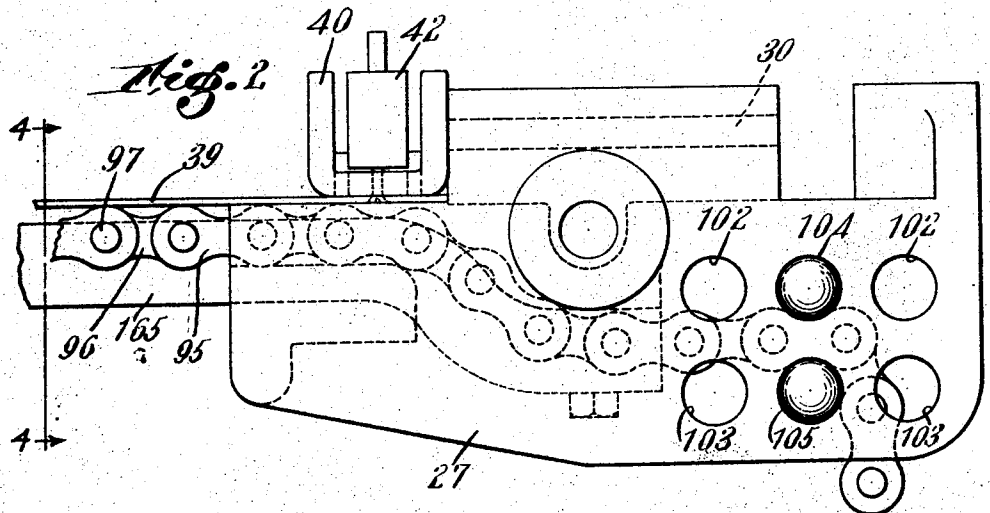


Fig. 2



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Fig. 3.

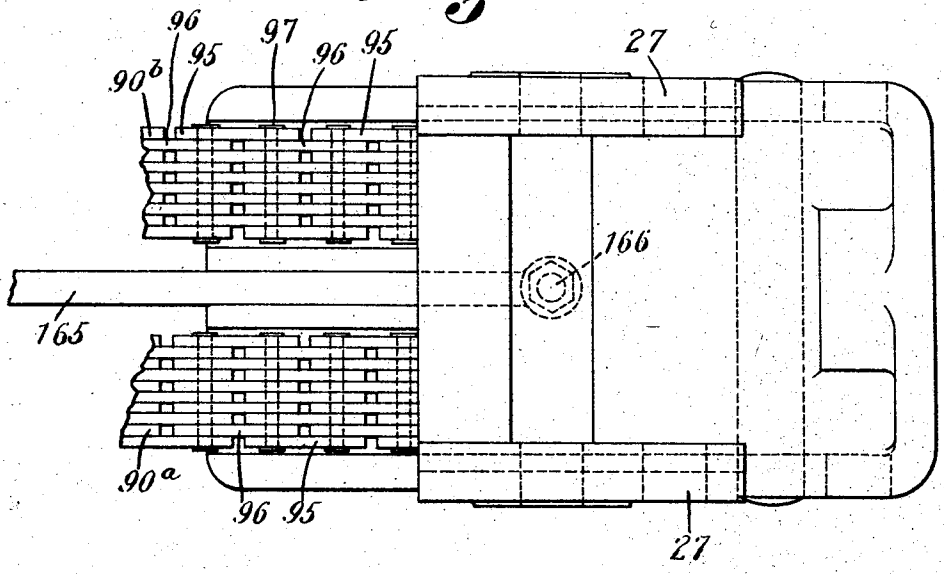
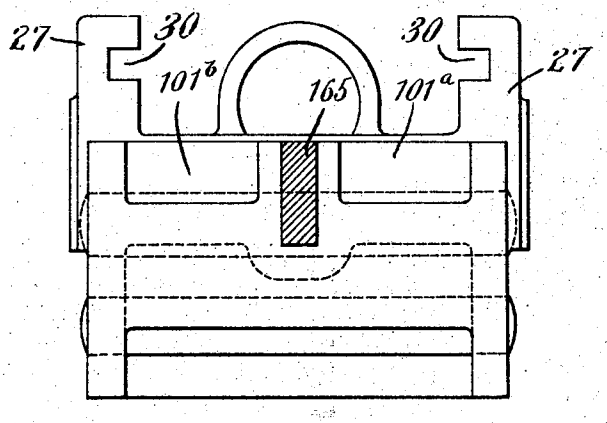


Fig. 4



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Patented July 28, 1925. 1,547,716

UNITED STATES PATENT OFFICE.

FRANK H. BANCROFT, OF GARDNER, MASSACHUSETTS, ASSIGNOR TO P. DERBY & CO., INC., OF GARDNER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

WOOD-BENDING MACHINE.

Application filed April 23, 1924. Serial No. 708,426.

To all whom it may concern:

Be it known that I, FRANK H. BANCROFT, a citizen of the United States of America, and resident of Gardner, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Wood-Bending Machines, of which the following is a specification.

This invention pertains to wood bending machines of the general type disclosed in the patent to Bancroft No. 1,461,471, dated July 10, 1923, and more particularly to improvements in and relating to the so-called master-strap forming an essential element of such machines.

One object of the present invention is to provide such a machine with an improved form of master-strap capable of withstanding the enormus strains imposed in bending wood of unusual thickness but sufficiently flexible to permit bending the wood to any radius likely to be encountered in the operation of the machine; a further object is to provide for accurate and rapid adjustment of the length of the master-strap to accommodate pieces of wood of widely different length.

In the accompanying drawing a preferred embodiment of the invention is illustrated by way of example.

Fig. 1 is a fragmentary transverse vertical section through the upper part of the machine showing the parts as positioned at the end of the bending operation;

Fig. 2 is a side elevation to larger scale showing the construction of one of the bending heads omitting certain parts and indicating the means for adjustably attaching the end of the master-strap thereto;

Fig. 3 is a fragmentary plan view of the head and improved master-strap; and

Fig. 4 is a transverse section on the line 4—4 of Fig. 2, omitting the master-strap.

Referring to the drawings in which a portion only of the machine is shown, the numerals 13 indicate the vertical supporting posts upon which the top casting 14 is mounted. This top casting preferably comprises spaced side members and a transverse member 16. The vertically movable table 17 is provided with guide openings through which the posts 13 extend, and is moved by means of rams 19 actuated by hydraulic or other pressure.

The table supports brackets 24 carrying pivoted links 25 which support the bending heads 27. Each bending head is provided with parallel guide grooves 30 for supporting and guiding a plunger 28 connected by a rod 31 to a piston 32 working in a hydraulic cylinder 33. The bending heads 27 are connected to each other by means of a master-strap 90 of improved construction which hereinafter will be described in detail.

A bracket 48 is supported upon the transverse member 16 of the top casting and is provided with means for attaching the form *b* about which the wood *a* is bent. A liner strap 39, preferably smooth and of flexible sheet metal, is supported by the master-strap 90. The opposite ends of the strap 39 are secured to blocks 42 which are free to slide to a limited extent in the channel members 40 which constitute abutments for the ends of the respective plungers 28. The central portion of the master-strap 90 may be supported upon an adjustable rest 55 during the bending operation.

The above described parts are in general quite similar to the correspondingly numbered parts in my Patent No. 1,461,471 above referred to which may be consulted for further information as to the specific construction of such parts and the general mode of operation of the machine.

In the patented machine the master-strap consists of a strip of sheet metal but in the present improved arrangement this master-strap, designated generally at 90, comprises two spaced parts 90^a and 90^b (Fig. 3), constructed as link belts or chains. Each belt or chain comprises series of links 95 and 96, of the usual figure-8 shape connected by pins or rivets 97 to form a flexible chain structure. These chains, as indicated in Fig. 3, are of substantial width so as to distribute the pressure over the surface of the wood to be bent.

For securing the master-strap comprising the chains to the bending head the latter is furnished with openings 101^a and 101^b in its ends which lead to channels or chambers extending inwardly and downwardly through the body of the head. At suitable points in the side walls of these channels upper and lower series of transverse openings 102 and 103 are formed, such openings being adapted to receive retaining pins 104 and 105 respectively. Opposed openings of the two series are spaced apart a distance sub-

stantially equal to the thickness of a chain link at its central or thinnest part so that when, as indicated in Fig. 2, a link is positioned between such openings and the pins 104 and 105 are placed in the openings the link is firmly clamped and retained against withdrawl from the bending head.

The openings of each of the series 102 and 103 are spaced apart a distance which may be either slightly less (as shown) or slightly greater than the length of an individual link of the chain. Thus, by moving the pins 104 and 105 into another pair of opposed openings the length of the chain may be adjusted by an amount less than the length of a link. It is also evident that the chain may be adjusted by an amount equal to any desired number of whole links merely by removing one of the pins and then moving the chain to the desired position.

As chains constructed as above described may be made very strong without sacrificing their flexibility to any appreciable extent it is thus possible to bend wood of great thickness without danger of overstraining or breaking the machine, whereas if the master-strap be made of sheet metal of sufficient flexibility for the purpose it is difficult to make it strong enough to support the stresses placed upon it during the bending of unusually heavy pieces of wood, for example, pieces three or more inches in thickness.

In the arrangement herein disclosed the brace rod 65 of the patented device is replaced by a rod 165 which is disposed between the laterally spaced members 90^a and 90^b of the master-strap and which is secured to the bending head by means of a bolt 166 which enters a threaded opening in the bending head at a point adjacent to the pivotal connection of the latter to the link 25.

As the operation of the machine is substantially the same as that of the patented machine, and as the improved master-strap functions in the same way as the master-strap disclosed in the patent, it is unecessary to describe the operation of the machine herein.

While a preferred form of chain construction is herein disclosed it is to be understood that other forms of flexible chain may be substituted for that here illustrated without departing from the spirit of the invention, while so far as its broader aspects are concerned it is contemplated that other chain adjusting means than those herein specifically disclosed may be substituted of desired or that such adjustment may be dispensed with under some circumstances.

I claim:

1. A wood bending machine having a pair of bending heads and a flexible chain connecting said heads, one at least of said heads having a channel for the reception of the end of the chain, and a plurality of openings disposed at opposite sides of the channel, and removable pins engageable with the respective openings for clamping a link of the chain between them.

2. A wood bending machine having a pair of bending heads and a link chain connecting said heads, one at least of the heads having a chamber for the reception of the end of the chain, the head having two parallel series of openings arranged at opposite sides of the chamber, the openings of each series being spaced apart a distance unequal to the bight of a chain link, and removable pins engageable with a selected pair of said openings to clamp the chain between then.

Signed by me at Gardner, Massachusetts, this 24th day of January, 1924.

FRANK H. BANCROFT.